

Sustainability Criteria for Planning, Constructing, and Operating Contingency Bases

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Background

- Contingency bases are temporary in nature, historically without consideration for sustainability in planning and design
- Experience in Iraq and Afghanistan show that supply lines to an isolated base are its greatest vulnerability
- Increasing a base's self-sufficiency or ***sustainability*** increases its ***security***
- Fewer resources = fewer soldiers on the road



Planning and Design

Contingency planners and designers do not have ***relevant*** sustainability criteria to consider

- ▶ US based criteria cannot be directly applied to a contingency environment or host nation cultural considerations
- ▶ Limited construction materials and equipment systems in theater of operation
- ▶ Most base designs consider individual components, not how they interact as a system
- ▶ Sustainability considerations typically not linked to force protection



Objectives

- Identify most relevant criteria from existing sustainability rating tools
- Develop prototype criteria for contingency bases to describe sustainability principles and practices
- Provide sustainability guidance to assist:
 - Contingency base camp planners and designers
 - Builders
 - Operators



Objectives

- The criteria will be focused on these objectives:
 - ▶ Improving base camp sustainability
 - Reducing external (shipped in) resources
 - Improving linkages to local cultural (and environmental) circumstances
 - Reducing resources for operating and maintaining camps
 - ▶ Enhance personnel health and quality of life



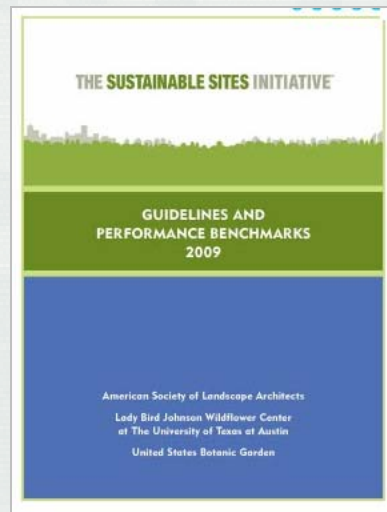
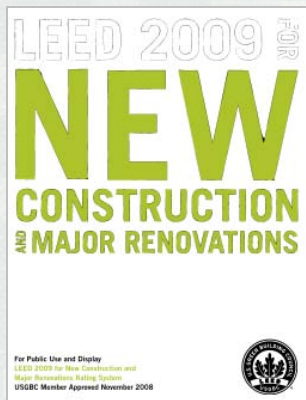
Framework

- The project team first developed a framework that categorizes criteria by base camp components found in the Sandbook including:
 - Life support
 - Command facilities
 - Power generation
 - Water/waste water
 - Transportation
 - Force protection
 - Maintenance operations
 - Cultural resources



Rating Systems

This analysis will look at specific criteria of each of these tools to determine their suitability and applicability to contingency bases.



envisiontm



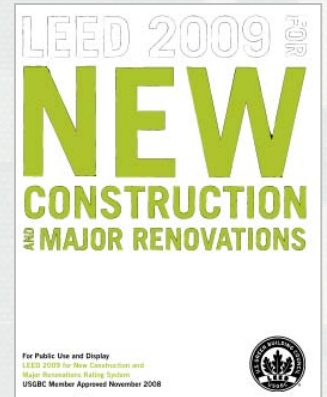
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Rating Systems

- LEED 2009 for New Construction and Major Renovations - (USGBC)

- For certifying the design and construction

- commercial or institutional buildings
 - high-rise residential buildings of all sizes
 - both public and private.



- Intent:

- To promote healthful, durable, affordable, and environmentally sound practices in building design and construction.



Rating Systems

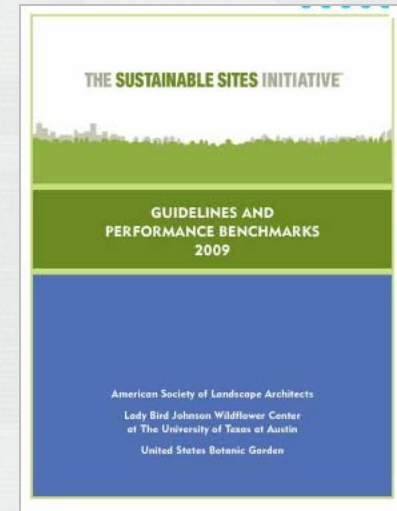


- LEED for Neighborhood Development
 - ▶ Emphasis on the site selection, design, and construction elements that bring buildings and infrastructure together
 - ▶ Relate the neighborhood to its landscape as well as its local and regional context.



Rating Systems

- Sustainable Sites Initiative
 - ▶ American Society of Landscape Architects
 - ▶ Lady Bird Johnson Wildflower Center
- Transformation in land development and practices
- Aims to supplement existing green building initiatives
- Sustainability: Environmental, Economic and Social



Rating Systems



- Envision 2.0
 - ▶ ASCE, Institute for Sustainable Infrastructure (ISI)
 - ▶ Covers civil infrastructure that makes up the built environment:
 - Roads, bridges, pipelines, railways, airports, dams, levees, landfills, water treatment systems
 - ▶ Does not include buildings or facilities
- Improvement in the performance and resiliency of physical infrastructure across the full dimensions of sustainability



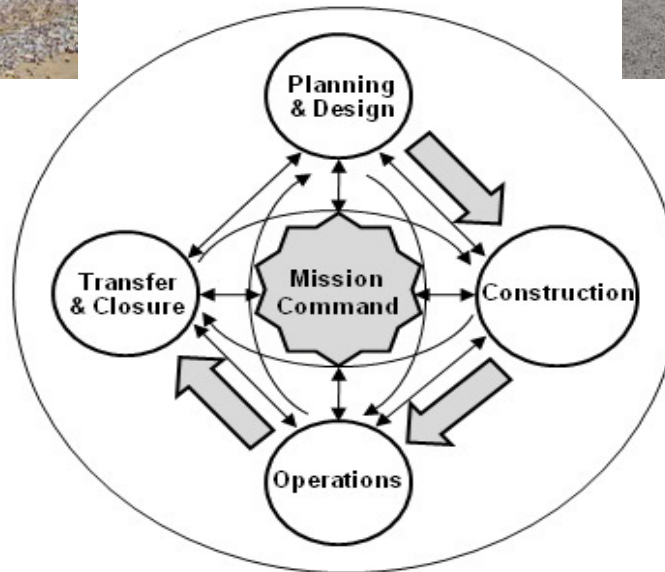
Examples of Sustainability Criteria

- LEED – New Construction and Major Renovation
 - ▶ Pollution Prevention – prevent loss of soil, sedimentation, air pollution
 - ▶ Water Use Reduction – use 20% less water
 - ▶ Storage and Collection of Recyclables – easily accessible dedicated area for collection
 - ▶ Minimum Energy Performance - 10% improvement
 - ▶ On-site Renewable Energy - solar, wind, geothermal, etc



LEED 2009 for Neighborhood Development			Phase	Base Camp Size	Comments
SMART LOCATION & LINKAGE					
PREREQ 1	Smart Location	no	Planning	N/A	Mission determines location.
PREREQ 2	Imperiled Species and Ecological Communities	some	Planning	All	Avoid those areas if possible. Be aware of cultural resources too.
PREREQ 3	Wetland and Water Body Conservation	yes	Planning	All	Avoid those areas if possible
PREREQ 4	Agricultural Land Conservation	some	Planning	Small	Mission determines location.
PREREQ 5	Floodplain Avoidance	yes	Planning	All	Avoid those areas if possible, balance expected between base camp duration with flood plain.
CREDIT 1	Preferred Locations	yes	Planning	All	Look at suitability of existing infrastructure, e.g. ports and airfields.
CREDIT 2	Brownfield Redevelopment	no	Planning	N/A	Don't want to clean up a site to use it. Too risky, takes too long.
CREDIT 3	Locations w/ Reduced Automobile Dependence	n/a	Planning	N/A	Base camp site location is chosen based on mission criteria, not public transportation.
CREDIT 4	Bicycle Network and Storage	n/a	Planning	N/A	Base camp site location is chosen based on mission criteria, not access to existing bicycle networks.
CREDIT 5	Housing and Jobs Proximity	n/a	Planning	N/A	Mission determines location.
CREDIT 6	Steep Slope Protection	yes	Planning, Design, Construction	All	Avoid disturbing steep slopes.
CREDIT 7	Site Design for Habitat /Wetland & Water Body Conservation	yes	Planning, Design, Construction	All	Avoid disturbing habitats, wetlands, water bodies and neighbors who care about them. The US does not want to incur liability for wetland restoration at the end of the mission.
CREDIT 8	Restoration of Habitat/Wetlands and Water Bodies	no	Planning	N/A	This isn't a contingency base issue.
CREDIT 9	Long-Term Cnsrvtn. Mgmt. of Habitat /Wetlands & Water Bodies	some	Planning, Design, Construction, O&M, T	Small	Conserve and manage habitat/wetlands & water bodies if they are in your footprint - but only for the duration of the camp.
NEIGHBORHOOD PATTERN & DESIGN					
PREREQ 1	Walkable Streets	yes	Planning, Design, Construction, O&M	Medium	Want major roads to have sidewalks, and provide safe walking paths for base camp occupants. Won't apply the specific LEED-ND criteria. Pay special attention to roads that connect LSA (life support areas) to common use areas.
PREREQ 2	Compact Development	some	Planning, Design, Construction	Medium	Plan carefully to accommodate similar functions in the same area to make development compact. Concept applies, same metrics won't.
PREREQ 3	Connected and Open Community	some	Planning, Design, Construction	Extra Small	Specific metrics won't apply, but concept does apply. Note exemption for military bases connectivity to outside communities. Consider connectivity and shared capabilities between bases in a base cluster.

Analysis Matrix: Life Cycle



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Analysis Matrix: Size



Extra Small
Small
Medium
Large



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Analysis Matrix: Duration

- Expeditionary (6 months or less)
- Temporary (up to 2 years)
- Semi-permanent (up to 10 years)
- Enduring (more than 10 years)



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Applicability of Criteria

LEED ND - **Walkable Streets**

- Intent:
 - ▶ To promote transportation efficiency.
 - ▶ To promote walking by providing:
 - Safe
 - Appealing
 - Comfortable street environments.



Applicability of Criteria

LEED ND - **Walkable Streets**

■ Requirements:

- ▶ *[...]functional entry on the front façade faces a public space, such as a street, square, park, paseo, or plaza [...]*
- ▶ *Continuous sidewalks or equivalent all-weather provisions for walking are provided along both sides of 90% of streets [...]*



Walkable Streets

Why does this concept applies to Contingency Bases?



VS.



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Walkable Streets

- Specific LEED-ND criteria does not apply
- Want major roads to have sidewalks
- Provide safe walking paths for base camp occupants
- Pay special attention to roads that connect LSA to common use areas



Applicability of Criteria

LEED NC – **Regional Materials**

- Intent:
 - ▶ To increase demand of materials/products from the region
 - ▶ Support the use of indigenous resources
 - ▶ Reduce environmental impacts from transportation



Applicability of Criteria

LEED NC – Regional Materials

- Requirements:
 - ▶ Products extracted, harvested or recovered within 500 miles
 - ▶ Minimum percentages:
 - 10% 1 pt
 - 20% 2 pts



Applicability of Criteria

Envision 2.0–Regional Materials

- Intent:
 - ▶ Minimize transportation costs and impacts and retain regional benefits through specifying local sources.
- Requirements:

Material	Distance Requirement
Soils and mulches	50 miles
Aggregates, Sands	50 miles
Concrete	100 miles
Plants	250 miles
Other materials (excluding equipment)	500 miles



Use of Regional Materials

Criteria on LEED NC and Envision 2.0 both applicable



VS.



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Applicability of Criteria

LEED ND– Historic Resource

Preservation and Adaptive Reuse

- Intent:
 - ▶ Preservation and adaptive use of *historic buildings and cultural landscapes*
 - ▶ Preservation of historic materials and character defining features.
- Requirements:
 - ▶ Do not demolish any historic buildings or alter any cultural landscapes as part of the project.



Applicability of Criteria

Envision 2.0— **Preserve Historic and Cultural Resources**

- Intent:
 - ▶ Preserve or restore significant historical and cultural sites and related resources to preserve and enhance community cultural resources.
- Requirements:
 - ▶ Increase efforts to understand community needs
 - ▶ From preservation and conservation to restoration and enhancement of cultural and heritage sites



Historic and Cultural Resources



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Next Steps

- Finish assessment process
- Identify most important criteria from each rating tool
- Organize sustainability criteria into usable guidance
- Provide explanations for users to understand how to apply these principles
- Stakeholders review draft guidance



Conclusions

- Contingency base camp community could reduce resources and improve quality of life by using these criteria
 - ▶ Not intended to be prescriptive
 - ▶ Helpful considerations and references
- Planners should use judgment and experience when applying these sustainability criteria



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